APPENDIX A
CONFIGURATION MANAGEMENT PLANS

QUESTIONS THIS APPENDIX WILL ANSWER?		Para.
1.	Why is a Government CM Plan necessary?	A.2, A.2.1
2.	What is the appropriate content for a Government CM Plan?	A.3
3.	How does the content differ from phase to phase?	A.3
4.	How should the Government CM Plan be used?	A.2.1
5.	How does the Government CM Plan differ from a contractor CM Plan?	A.2.2
6.	What should the content of a Contractor CM plan be?	A.3
7.	How should the contractor CM Plan be evaluated?	A.3

A.1 Scope.

This appendix provides guidance in the content, use and maintenance of Government configuration management plans. It also provides guidance in evaluating contractor CM plans. A.2 below contains basic guidance amplifying the text in Section 2. **[2.3.1]** It is followed in A.3 by activity guides delineating the content of both Government and Contractor plans.

A.2 Principles and Concepts

As described in Section 2, CM planning is a vital part of the preparation for the next phase of a program life cycle. The configuration management plan documents the results of that planning to enable it to be communicated and used as a basis in managing the program configuration management activities.

A.2.1 Government CM Plan.

The Government CM Plan may be documented as a standalone document, or it may be combined with other program planning documents. It has a two-fold purpose. The first purpose is to document the planning for the Government CM activity to take place during the upcoming phase and to schedule specific actions necessary to implement those activities. The second purpose is to communicate and coordinate the Government's intentions with the contractor or contractors involved in the program so that efficient and effective interfacing processes and working relationships may be established.

The government CM plan should be used as a repository for the ideas, schedules, actions and agreements that drive the activity during a given phase, including such elements as interface agreements, MOUs, system development, process documentation, operating procedures and training. Along with specific operating procedures, the CM plan provides guidance to the consistent application of CM across multiple integrated process and product development teams. It should also be used as a place to capture and evolve information that can be used to evaluate contractor activity, record specific experiences and document lessons learned.

EIA Standard 649 contains some practical guidance that is applicable for the Government as well as for contractors, as illustrated in **Table A-1**.

In preparing a Government CM Plan, it should not be necessary to "re-invent the wheel" for each phase of every program. Information developed in prior phases, and in prior programs can be used effectively as source material, where appropriate. However, a careful analysis of the needs of the particular phase is necessary to avoid the implementation of any activity that would not be value-adding. The CM Templates in Section 2 should be used as guides/shopping lists to aid in the selecting appropriate activities and metrics.

Table A-1. CM Principles Effected in Government CM Plan

EIA-649	Government CM Plan
Plan CM processes for the context and environment in which they are to be performed	• *The Government CM plan communicates to the contractor, the Governments CM objectives for a given phase and the associated risks if those objectives are not met* • *It describes the expected deployment and use of the system/CI* • *It indicates the CM process, systems, and methodologies the Government plans to use and the interfaces which the contractor will be expected to establish; specifically describes use of IPPD teams and PDM systems* • *It describes the acquisition strategy in terms of the types of CIs that the Government intends to support organically, and those for which Contractor Logistic Support (CLS) will be required; including preference for Commercial-Off- the-Shelf (COTS), as applicable* • *It reflects the Government's plan for baselining and configuration control* • *It describes the Configuration Status Accounting system that the Government will use in Phase III (Production, Fielding/Deployment and Operational Support)* • *It projects the anticipated configuration information needs of the Government; and the Government information infrastructure* • *It indicates the Government's strategy for conducting configuration audits; the degree of selectivity and the selection criteria* • *It provides (prior to Phase III) any special requirements for, activities to occur at the end of production and at demilitarization and disposal of items at the end of the phase such as environmental waste issues, and any records that must be maintained*
Assess the effectiveness of CM Plan implementation and performance of the CM discipline with defined metrics,	• *The Government CM plan should lay out the metrics that the Government will use to measure the effectiveness of the Government internal CM process and the contractor CM process.*

Activity Guide: Table A-2 provides a topic by topic compendium of the subject matter that should be considered in preparing a Government CM plan for each of the four phases of a program life cycle. As with the configuration documentation, the CM Plan evolves from broad conceptual ideas for Phase 0 and Phase I to specific descriptions of mature and proven processes in Phase III.

A.2.2 Contractor CM Plan

In the past, the Government stated its requirements in RFPs by reference to MIL-STDs. Even though tailoring of the MIL-STD was mandatory, it was often inadequately done. The contractor responded with a plan that cited compliance to the MIL-STD without disclosing significant details of how that compliance was to occur.

The current environment is quite different. The Government states its formal requirements succinctly in the form of a Statement of Objectives The contractor responds with a proposal containing a description of the processes that will be implemented and a SOW scoping the tasks to be performed. Seldom, however, particularly on major programs, are the formal proposal requirements the whole story. Typically there are several rounds of draft RFPs and communications sessions between Government and Contractor prior to the formal issuance of RFPs. The Government program personnel must complete their planning early in this cycle and can benefit from review and coordination with counterpart contractor personnel. Thus the content of the Government CM Plan should be known to the contractor. The contractor also formulates his planning in a similar time frame in order to be prepared to compare notes and provide meaningful input to the Government.

The Contractor's CM Plan, prepared or revised for a given phase, should reflect compatibility with the Government's plan. While both plans contain some common topic areas, they are addressed from different perspectives. The contractors CM plan also has a dual purpose. One purpose is to provide the framework for the contractor's application of CM on the specific program in order to manage the configuration of the product in a prudent and efficient manner. The other purpose is to provide the Government with assurance that the Government interfaces and information needs will be satisfied, and that a product of known and documented configuration will be delivered, and in many cases maintained. The CM Plan should describe the contractor's CM objectives, the value adding CM activities that will be employed to achieve them, and the means of measuring and assuring that they are effectively accomplished.

There have been many definitions of CM Plan content over the years. They evolved into Appendix A of MIL-STD-973, a consensus description coordinated with industry and Government. EIA Standard 649 contains a briefer generalized description of CM plan content without dictating any specific sequence of information. Any CM Plan outline consistent with either guidance should be acceptable if it conveys information at an appropriate depth for the specific program environment.

Activity Guide Table A-3 should provide no surprises to the experienced CM practitioner since it is essentially the same as the MIL-STD-973 outline. Acquisition reform does not impact the selection of topics to be discussed, although it may affect the textual content.. As with the Government plan, the Section 2 CM Templates for each phase, provide guidance in evolving the specific objectives, activities, information and metrics to be described in the plan.

A.3 CM Plan Activity Guides.

The following activity guides are intended to assist the Government CM Manager in preparing the Government CM Plan and in evaluating the Contractors CM Plan.

Activity Guide: Table A-2. Government CM Plan Content

Section Title	
Section Content	**Phase by Phase Guidance**
Section 1. Introduction	
• The purpose and scope of the configuration management plan and the program phase(s) to which it applies • A brief description of the system or top level CIs • Reference to applicable directives or glossaries containing definitions of terminology and acronyms used in the plan	• Phase O - Focus on the long range conceptual view of the life cycle • Phase I - Update long range view; focus on near term program definition and risk reduction; plan for development, production and support • Phase II - Finalize conceptual vision; focus on the development effort and requirements for production and support • Phase III - Focus on Production, support, deployment , demilitarization and disposal
Section 2. Reference Documents	
• List of the specifications, standards, manuals and other documents, referenced in the Plan by title, document number, issuing authority, revision, and as applicable, change notice, amendment , and issue date	• Same for all phases, where applicable
Section 3. Government CM Concept of Operations and Acquisition Strategy	
• CM Concept of Operations - A description of the Government's CM objectives ✓ Rationale for the objectives ✓ Relation to program objectives ✓ Risks associated with not meeting objectives ✓ Measurement/criteria for assessing accomplishment - Information needed to support the achievement of objectives in the current and future phases • CM Acquisition Strategy - The Government Acquisition Strategy for the System/CI(s) ✓ Identified by Government or Contractor? ✓ How will the selection of CIs proposed by contractor be approved? ✓ Expected deployment and use by the operating forces ✓ Organic or Contractor Logistic Support ✓ Governments intentions with respect to baselining and Configuration Control ✓ Life cycle operational and maintenance needs that the CM approach needs to satisfy - To what level are performance specifications required? ✓ Government or contractor preparation ✓ Government or contractor approval - What level of configuration identification required by the Government; By the Contractor? - What level of Government Configuration Control is necessary in the current phase? - What baselines will be established? ✓ What documents need to be included in those baselines? ✓ Who will be the control activity for those baselines? - What status accounting tasks are necessary? ✓ Who should perform those tasks? Government? Contractor? - To what extent should Government and contractor data be digital? on-line access? Paper?	• **[Ref: Section 2, Para. 2-3]** • For each phase, reflect the common understanding between the Government and the contractor concerning the factors required to implement complementary CM processes • Information to facilitate selection of the appropriate value added activities and actions for each phase

Activity Guide: Table A-2. Government CM Plan Content

Section Title	
Section Content	**Phase by Phase Guidance**
Section 4. Organization	
• Description and graphic portraying the Government's planned organization with emphasis on the CM activities, including: - The relationships of the Government project organization, IPT structure, functional organizations, prime and subordinate contractors - Identification of the program/project individual responsible for CM (hereinafter referred to as the Government CM Manager) - The relationships with related Commands, or Service Components and how the relationship is defined, e.g. the establishment of MOUs or other forms of working relationships. - Responsibility and authority for CM of all participating groups and organizations including ✓ Their role in configuration control boards ✓ The integration of CM functions with other program activities ✓ Interfaces with the Government CM Manager	• In Phases 0 and I, the Government's CM organizational focus is on establishing appropriate interfaces, and planning for Phase II and III • In Phase II the focus is implementation of a comprehensive Government CM Process, training, and establishing an effective team environment with contractor(s), and DCMC on-site representatives • Phase III the relationships should focus on control necessary for production, life cycle support and transition to a maintenance environment
Section 5. Data Management	
• Technical data concept of operation including such elements as: - CALS/CITIS implementation including data transfer and format standards and protocols - Specific information needs - Access requirements - Formats supported - Network interface parameters - Data base model	• A phased approach to Continuous Acquisition and Life Cycle Support (CALS) planning and implementation - provides the capability needed in each phase, and - Introduces technology improvements in each phase
Section 6. Government Configuration Management Process	
• Description of the Government CM process for accomplishment of the following (underlined) Configuration Management activities and: - Applicable Government and Government/Contractor CM actions - Selected decision criteria, and evaluation factors, where applicable - Metrics, if any, and their relation to CM Objectives (Section 3) • <u>CM Planning and Management</u> - In addition to applicable actions, description and graphics portraying CM phasing and milestones, i.e., milestones for implementation of the Government CM process in phase with major program milestones and events, including as a minimum: ✓ CM Activities for the current phase ✓ CM Activities and selected actions for future phases ✓ Establishment of interface agreements and MOUs ✓ Establishment of Government CCB ✓ Approval of configuration documentation establishing Government Functional, Allocated and (where applicable) Product Baselines ✓ Implementing Government CM AIS ✓ Conducting major configuration audits - Upon Update of the plan, record completion of actions and document lessons learned • <u>Configuration Identification</u> • <u>Configuration Control</u> • <u>Configuration Status Accounting</u> • <u>Configuration Audits</u>	• **[Ref: Tables 2-1 through 2-4]** • Recognize the global nature (applicable to all phases) of the following types of actions: - Preparation for the next phase - Implementing the Government CM Process - Measuring and evaluating both the Government and the Contractor's CM Process - Effecting process improvements and documenting lessons learned **[Refer to Section 2, Para. 2.3]**

Activity Guide: Table A-3. Contractor CM Plan Content

Section Title	
Section Content	**Phase by Phase Guidance**
Section 1. Introduction	
• The purpose, scope and specific contractual applicability of the configuration management plan and the program phase(s) to which it applies • A brief description of the system or top level CI, and of the component lower level CIs, using approved CI nomenclature when available, to which the CM Plan pertains • Reference to applicable directives or glossaries containing definitions of terminology and acronyms used in the plan • A description of the plan's major features and objectives and a concise summary of the contractor's approach to CM, including any special conditions (such as large number of organizations, security constraints, inter-operability constraints, unique contracting methods, non-developmental items, etc.) upon which the approach is based.	• Phase O - Focus on the near term conceptual studies, and provide long range conceptual view of the potential Phase I, II and III • Phase I - Focus on the near term program definition and risk reduction; planning for development and the long range conceptual view of production and support • Phase II - Focus on the development effort and the requirements for production and support • Phase III - Focus on Production, support , deployment and eventual demilitarization and disposal
Section 2. Reference Documents	
• List of the specifications, standards, manuals and other documents, including contractor policy directives, referenced in the Plan by title, document number, issuing authority, revision, and when applicable, change notice, amendment number, and date of issue.	• Same for all phases, where applicable
Section 3. Organization	
• Description and graphic portraying the contractor's organization with emphasis on the CM activities, including: - The relationships and integration of the project organization, IPT structure and functional organizations - Responsibility and authority for CM of all participating groups and organizations including their role in configuration control boards, and the integration of CM functions with other program activities - Identification of the CM organization and its responsibilities; - Interfaces between the CM organization and the tasking activity, subordinate performing activities, and associate performing activities.	• Essentially the same for all phases with some differences in emphasis • In Phases 0 and I, the emphasis should primarily be on support for the systems engineering process. • In Phase II the emphasis should shift to include the interplay with engineering and manufacturing development activities in the IPT environment and the need to support the product after delivery • In Phase III the organizational relationships and authorities should reflect control necessary for production and support and a transition to a maintenance and disposal environment
Section 4. Configuration Management Phasing and Milestones	
• Description and graphics portraying the sequence of events and milestones for implementation of CM in phase with major program milestones and events, including as a minimum: - Release and submittal of configuration documentation in relation to program events (for example technical reviews) - Establishment of internal developmental configuration and contractual baselines - Implementation of internal and tasking activity configuration control - Establishment of configuration control boards - Implementation of a status accounting information system and provision of reports/or access to the status accounting information, and - Conduct of configuration audits.	• During phases 0 and I, configuration control should be informal; baselining should be for convenience in defining known configurations at key points. • Most of the milestone phasing in the first column should occur in Phase II, where the full scale development, testing integration and audits take place • Most of the milestones should be achieved by the start of Phase III . Typically phase III milestones and events are somewhat repetitive unless there is planned product improvement. Careful consideration should be given to the end portions of this phase.

Activity Guide: Table A-3. Contractor CM Plan Content

Section Title	
Section Content	**Phase by Phase Guidance**
Section 5. Data Management	
• Description of the methods for meeting the configuration management technical data requirements in the Continuous Acquisition and Life Cycle Support (CALS) environment	• In all phases, this section should reflect an understanding of the Governments concept of operation, discrete information infrastructure and specific information needs
Section 6. Configuration Identification	
• The contractor's configuration identification process and procedures, including, as applicable: - Recommendation of system elements as candidates for designation as CIs (HWCIs and CSCIs) - Maintenance of developmental configuration including document, drawing and software development libraries and corrective action process - Recommendation and generation of the configuration documentation required for the Functional, Allocated and Product baselines and graphic illustration of configuration documentation relationships - Release and correlation of manufactured products - Assignment and application of configuration identifiers including document numbers, nomenclature, serial numbers, and part numbers and software identifiers to hardware, software and firmware	• In Phases 0 and I, the configuration identification process would focus on technical reports, conceptual configurations and design, test and simulation models. • In Phases II and III all of the configuration attributes in the left column apply
Section 7. Interface Management	
• The procedures for identification of interface requirements, establishment of interface agreements, and participation in interface control working groups (ICWG).	• This process applies to a degree in all phases • Phases 0 and I teaming agreements should contain provisions for interface definition and protection of proprietary information
Section 8. Configuration Control	
• This section shall describe the contractor's configuration control procedures including, as applicable: - Functions, responsibility, and authority of configuration control boards; - Classification of changes, and the level of authority for change approval/concurrence - Processing of Class I Engineering Change Proposals (ECPs) and Value Engineering Change Proposals (VECPs) - Processing of Class II ECPs - Processing of Requests for Deviation (RFDs) - Processing of Notices of Revision (NORs)	• In Phases 0, configuration control will typically be limited to a release and notification process • In phase I configuration control would be expected to continue to be informal • In phase II, the configuration control process should formally start as soon a functional baseline is established and should continue for the life of the program thereafter.
Section 9. Configuration Status Accounting	
• Contractor's procedures for configuration status accounting, including, as applicable: - Methods for collecting, recording, processing and maintaining data necessary to provide status accounting information via reports and/or database access; - Description of reports/information system content related to, as applicable: ✓ Identification of current approved configuration documentation and configuration identifiers associated	• The focus of configuration status accounting information evolves through the phases of a program • In Phase 0, the focus is on conceptual studies and analyses • In Phase I, the focus is on the evolving program definition documentation • In phase II, the focus is initially on specifications

Activity Guide: Table A-3. Contractor CM Plan Content

Section Title	
Section Content	**Phase by Phase Guidance**
with each CI ✓ Status of proposed engineering changes from initiation to implementation; ✓ Results of configuration audits; status and disposition of discrepancies ✓ Status of requests for critical and major deviations ✓ Traceability of changes from baselined documentation of each CI ✓ Effectivity and installation status of configuration changes to all CIs at all locations. - Methods of access to information in status accounting information systems and/or frequency of reporting and distribution.	and design documents, then shifts to include product configuration, as well • During Phase III, the focus encompasses the product configuration and the configuration of all associated support elements
Section 10. Configuration Audits	
• Contractor's approach to including, as applicable, plans, procedures, documentation, and schedules for functional and physical configuration audits; and format for reporting results of incremental or completed configuration audits.	• The configuration audit requirements typically pertain to Phases II and III
Section 11. Subordinate Performing Activity/vendor Control	
• Methods used by the contractor to ensure the effectiveness of subcontractor and vendor configuration management processes	• Typically applicable in Phases II and III. Applicable in phase I where necessary to support test and simulation hardware and software.